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PCT/KR2003/001577  
DT12 Rec'd PCT/PTO 28 JAN 2005INNER SOLE ADJUSTABLE IN WEIGHT**TECHNICAL FIELD**

The present invention relates to a footwear insole  
5 designed to be put in footwear, and more particularly, to a  
footwear insole, which is provided at a rear portion with a  
load-applying part to thereby increase the weight of the  
footwear.

**10 BACKGROUND ART**

As is well known, a sandbag or a lead-bag is often  
worn on an ankle of a user, or even a lead jacket is worn  
by a user as a load-applying member to enhance an exercise  
effect. Such a load-applying member increases the load  
15 applied to the user wearing the same, thereby increasing  
the burning of calories and improving the exercise effect.  
Therefore, the load-applying member has been used by  
athletes to quickly increase the exercise effect in a short  
period of time.

20 However, the user has to specially buy the load-  
applying member and needs a specific place and time for  
using the same. Although it is possible for the user to  
wear the load-applying member on his/her body in their  
daily lives, this may be unbecoming for a person who is not  
25 an athlete but wants to obtain the improved exercise effect

during normal living.

Therefore, there is a need for load-applying means that is inconspicuous while increasing the load applied to the user to improve the exercise effect during a normal  
5 walk.

#### DISCLOSURE OF THE INVENTION

Accordingly, the present invention has been made in an effort to solve the above-described problems of the prior  
10 art.

An object of the invention is to provide a footwear insole that is provided at a rear portion with a load-applying part to thereby increase the weight of the footwear.

15 Another object of the present invention is to provide a footwear insole that is inconspicuous while increasing the load applied to the user to improve the exercise effect during normal walking.

To achieve these objects and other advantages and in  
20 accordance with the purpose of the invention, as embodied and broadly described herein, there is provided a footwear insole put in a footwear when used, comprising: an insole body put in the footwear; and a load-applying part installed on a rear portion of the insole body to apply  
25 load to a user wearing the footwear with the insole body.

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The load-applying part comprises an insert member formed of a heavy weight material and installed in the insole body in parallel with a bottom of the insole body; and a receiving part for receiving the insert member, the receiving part being formed of an elastic material.

The load-applying part is designed to be attachable to or detachable from the insole body.

#### BRIEF DESCRIPTION OF THE DRAWINGS

10        FIG. 1 is a perspective view of a footwear insole according to a first embodiment of the present invention, in which metal rods are partly inserted into the footwear insole;

15        FIG. 2 is a side view of a footwear insole according to a first embodiment of the present invention, in which metal rods are removed from the footwear insole;

FIG. 3 is a bottom view of a footwear insole according to the present invention;

20        FIG. 4 is a sectional view taken along line A-A in FIG. 3;

FIG. 5 is an enlarged view of a circled portion B of FIG. 4 to illustrate an air circulation device;

25        FIG. 6 is a perspective view of a footwear insole according to a second embodiment of the present invention, in which a U-shaped metal rod is removed from the footwear

insole;

FIG. 7 is a perspective view of a footwear insole according to a third embodiment of the present invention, in which a metal plate is removed from the footwear insole;

5        FIG. 8 is a perspective view of a footwear insole according to a fourth embodiment of the present invention, in which a load-applying part is removed from the footwear insole; and

FIG. 8 is a sectional view of footwear where a  
10 footwear insole according to the first embodiment of the present invention is applied.

#### **BEST MODE FOR CARRYING OUT THE INVENTION**

It is to be understood that the following detailed  
15 description with the accompanying drawings of the present invention are exemplary and explanatory, and therefore it will be apparent to those skilled in the art that various modifications and variations can be made in the present invention.

20        FIG. 1 shows a perspective view of a footwear insole according to a first embodiment of the present invention, in which metal rods are partly inserted into the footwear insole, and FIG. 2 shows a side view of a footwear insole according to a first embodiment of the present invention,  
25 in which metal rods are removed from the footwear insole.

As shown in the drawings, the inventive footwear insole 10 has an insole body 12 that is substantially identical to the conventional one in its general shape. That is, the footwear insole 10 has an insole base 14 whose thickness gradually increases as it goes from a front end to a rear end, and a protruded edge 16 that is elevated from an edge of the insole base 14. The insole body 12 is formed of a material that has elasticity and flexibility that are required for the footwear insole.

10 The insole body 12 is provided at a rear portion where the heel of a user will be located with holes H in which cylindrical metal rods 18 can be inserted. FIG. 1 shows a state that half of each rod 18 is inserted into each hole H, and FIG. 2 shows a state that the rods 18 are taken out of  
15 the holes H. To realize this structure, a rear portion of the footwear insole 10 of the present invention may have a thickness greater than that of the conventional one.

Meanwhile, a cylindrical receiving part 20 for removably receiving the metal rods 18 is formed around each  
20 of the holes 18. The cylindrical receiving part 20 has a length identical to or slightly greater than that of the metal rod 18. Although the receiving part 20 is partly shown in FIGs. 1 and 2 for the convenience, it is preferable that the receiving part 20 is installed  
25 penetrating the insole body 12 in a lateral direction.

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Since the receiving part 20 is formed penetrating the insole body 12 in the lateral direction and the metal rod 18 has a length substantially identical to that of the receiving part 20, it is easy to insert or remove the metal rod 18 into or from the receiving part 20. That is, the metal rod 18 can be fully inserted into the receiving part 20 by a simple pushing operation, and can be removed from the receiving part 20 by pushing one end of the metal rod so that it can be partly exposed out of the receiving part 20 as shown in FIG. 1 and pulling the exposed portion of the metal rod 18 to fully remove the metal rod from the receiving part 20.

The receiving part 20 is formed of an elastic material that can absorb impact applied to the metal rod 18, thereby providing a smooth feeling to a user wearing footwear comprising the footwear insole 10 with the metal rods 18. The elastic material absorbs the impact caused by the user's weight while preventing the deformation of the receiving part 20 when the metal rod 18 is removed. The elastic material can be formed of a synthetic resin-based material, a rubber-based material, a metal-based material, or a mixture material thereof. The synthetic resin-based material is selected from the group including polycarbonate (PC), polyurethane (PU), polyvinyl chloride (PVC), polyethylene (PE), acrylonitrile butadiene styrene (ABS),

nylon, TPR, acryl, and PETE. The rubber-based material is selected from the group including natural rubber and synthetic rubber. The metal-based material is selected from the group including a shape memory alloy, titanium, spring steel, brass, aluminum, and an alloy thereof.

FIG. 3 shows a bottom view of a footwear insole according to the present invention, FIG. 4 shows a sectional view taken along line A-A in FIG. 3, and FIG. 5 shows an enlarged view of a circled portion B of FIG. 4 to illustrate an air circulation device.

As shown in the drawings, the insole base 14 is provided at a bottom with three longitudinal grooves 24 formed in a longitudinal direction of the footwear insole 10, and a plurality of lateral grooves 26 formed in a lateral direction of the footwear insole 10 to cross the longitudinal grooves 24. A plurality of vertical passages 22 are formed to penetrate the footwear insole 10 in a vertical direction at crossing points of the longitudinal and lateral grooves 24 and 26. An empty space S is formed at each of the crossing points where the passage 22 is formed.

When the user wears the footwear with the footwear insole and walks, the insole base 14 is compressed when the footwear contacts the ground and the volume of the empty spaces S is reduced. At this point, the air in the empty

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spaces S is directed to the foot of the user through the passages 22. When the user's footwear comes off the ground, the empty spaces S are intended to return to their initial shape by elastic force of the insole base 14. The returning  
5 force sucks the air into the empty spaces S through the vertical passages 22 and the grooves 24 and 26.

The above process is repeated while the user works or runs, so the footwear enclosing the user's foot is well ventilated, thereby providing a cool feeling to the user.  
10 That is, the ventilation allows the user's foot to maintain a dried state to provide good sanitation.

FIG. 6 shows a perspective view of a footwear insole according to a second embodiment of the present invention. Since a footwear insole 100 of this second embodiment is  
15 similar to the footwear insole 10 of the first embodiment, only the different parts will be described herein.

The footwear insole 100 of this embodiment employs a U-shaped metal rod 118 while that of the first embodiment employs a plurality of cylindrical metal rods 18. Therefore,  
20 the receiving part 120 is designed to receive the U-shaped metal rod 118. The member 120 has two parallel receiving passages 120a and it is preferable that vertical passages 122 for ventilation are not communicated with the two parallel receiving passages 120a.

25 FIG. 7 shows a perspective view of a footwear insole



according to a third embodiment of the present invention. Since a footwear insole 200 of this third embodiment is similar to the footwear insole 10 of the first embodiment, only the different parts will be described herein.

5       The footwear insole 200 of this embodiment employs a metal plate 218 while that of the first embodiment employs a plurality of cylindrical metal rods 18. Therefore, the receiving part 220 is designed to receive the metal plate 118. The metal plate 218 includes a U-shaped rod portion  
10 218a and a flat portion 218b integrally formed with the inner surface of the U-shaped rod portion 218a. The flat portion 218b is provided with a plurality of holes 219 communicating with the vertical passages 222 for the ventilation.

15       The shape of the metal plate 218 is not limited to the above. That is, metal plate can be designed to be flat throughout its whole surface.

FIG. 8 is a perspective view of a footwear insole according to a fourth embodiment of the present invention,  
20 in which a load-applying part 300 is separated from a conventional footwear insole.

That is, the load-applying part 300 of this embodiment is specially manufactured from the conventional footwear insole 301 and is designed to be attached on the  
25 conventional footwear insole 301. That is, the load-

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applying part 300 comprises a main body 310, metal rods 312 removably inserted into a rear portion of the main body 310, and receiving portions 314 for receiving the metal rods 314. Deposited on a top surface of the main body 310 is adhesive  
5 on which a protecting film 318 is attached to protect the adhesive from impurities. Accordingly, user can remove the protecting film 318 from the main body 310 and attach the load applying part 300 to a conventional footwear insole 310. Needless to say, it is also possible to fixedly attach  
10 the load-applying part on the footwear insole through adhesion or needlework process during a footwear manufacturing process. It is also possible for the user to use the load-applying part by putting the same in the footwear without using an adhesive whenever he/she wants to  
15 use the same.

In this embodiment, although three metal rods are exemplified for the descriptive convenience, the number of the metal rods is not limited in this embodiment. For example, as in the first, second and third embodiments,  
20 five metal rods, the U-shape metal rod or the metal plate can be used.

Meanwhile, in the above embodiments, although the metal rods 18, the U-shaped metal rod 118, the metal plate 218 and the metal rods 312 are all described to be  
25 removable from the footwear insole, they may be inserted

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into holes of the load applying part or the receiving part and then integrally formed with the footwear insole or the load-applying part through a molding process during the manufacturing process of the footwear insole.

5        In addition, the weigh increasing member is not limited to the metal rods 18, the U-shaped metal rod 118, the metal plate 218 and the metal rods 312 that are described in the above embodiments. A variety of modifications equivalent to them will be also possible. In  
10 addition, the metal can be replaced with a material or a mixture selected from stone, brick, and concrete.

FIG. 9 shows a sectional view of footwear where a footwear insole according to the first embodiment of the present invention is applied.

15        The user uses the footwear insole 10 of the first embodiment in a state where it is put in the footwear as shown in FIG. 9. At this point, the metal rods 18 may be inserted into the footwear insole as shown in the drawing and removed from the footwear insole in case of need. When  
20 the metal rods 18 are inserted, since the weight of the footwear 1 is increased, the user can obtain an effect similar to a case that he/she wears the sandbag around his/her ankle. Furthermore, as described above, the air is discharged from the footwear insole 10 to refresh and dry  
25 the user's foot, maintaining the good sanitary of the

footwear 1.

#### INDUSTRIAL APPLICABILITY

As described above, when the user uses the footwear  
5 insole of the present invention, since the weight of the  
footwear is increased, the user can obtain an effect  
similar to a case that he/she wears the sandbag or the lead  
jacket, thereby increasing the burning of calories and  
exercise effect.

10 In addition, wherever the user walks, the air is  
discharged from the footwear insole to reduce the  
temperature and moisture of the footwear, thereby  
refreshing and drying the user's foot and maintaining the  
good sanitary of the footwear.

15 Furthermore, since the height of the footwear insole  
of the present invention is greater than that of the  
conventional one, when the user wears the footwear having  
the footwear insole of the present invention, he/she looks  
taller.

20 In addition, when the metal rods are removed from the  
footwear insole, since the hard inserts are removed while  
maintaining the thickness of the insole, an effect that a  
cushion of the footwear is improved can be obtained.